Amendment to the Claims:

1. (Currently amended) A nuclear camera capable of performing SPECT imaging, the nuclear camera including:

a rotatable gantry defining a gantry rotation axis and an imaging isocenter; and

a gamma detector arranged on the rotating gantry at a constant fixed radial distance from the imaging isocenter to circularly and non-conformally orbit the imaging isocenter at the constant fixed radial distance, the gamma detector including a radiation-sensitive surface and a collimator that collimates incoming radiation.

2. (Previously presented) The nuclear camera as set forth in claim 1, wherein the collimator includes:

a plurality of spaced apart slats arranged transverse to the radiation sensitive surface, each adjacent slat pair defining a viewing plane.

3. (Previously presented) The nuclear camera as set forth in claim 2, wherein the gamma detector further includes:

a means for spinning the collimator slats and the radiation sensitive surface about a slat rotation axis that is generally orthogonal to the gantry rotation axis.

4. (Currently amended) The nuclear camera as set forth in claim 3, wherein:

the slats have a spacing and height selected based on a selected spatial imaging resolution, a predetermined imaging time, and the fixed radial distance; and

a width of ~~each generally linear detector~~ the radiation sensitive surface parallel to the slats is selected based on a selected detector sensitivity, the predetermined imaging time, the fixed radial distance , and the slat pair.

5. (Previously presented) The nuclear camera as set forth in claim 4, wherein the slat height in a direction transverse to the radiation sensitive surface

corresponds to a ratio of the fixed radial distance and the selected spatial imaging resolution.

6. (Previously presented) The nuclear camera as set forth in claim 3, wherein the radiation sensitive surface includes an array of solid state detector elements.

7. (Previously presented) The nuclear camera as set forth in claim 6, further including:

a radiation source disposed on the rotatable gantry and producing transmission radiation; and

an transmission radiation detector mounted opposite the radiation source that detects the transmission radiation.

8. (Previously presented) The nuclear camera as set forth in claim 1, further including at least four gamma detectors mounted at the fixed radial distance from the imaging isocenter.

9. (Previously presented) The nuclear camera as set forth in claim 8, further including:

at least a pair of radiation detectors oppositely mounted on the rotatable gantry that are configured to perform coincidence detection of radiation emitted during positron electron annihilation.

10. (Previously presented)The nuclear camera as set forth in claim 8, wherein the:

the gamma detectors are collimated for at least two different imaging resolutions.

11. (Currently amended) ~~The~~ A nuclear camera ~~as set forth in claim 1, further~~ including:

a rotatable gantry defining a gantry rotation axis and an imaging isocenter;

a gamma detector arranged on the rotating gantry at a constant fixed radial distance from the imaging isocenter, the gamma detector including a radiation-sensitive surface and a collimator that collimates incoming radiation;

a second radiation detector arranged on the rotating gantry at a constant fixed radial distance from the imaging isocenter, the second radiation detector being configured for at least one of a different resolution and a different imaging modality; and

a first generally toroidal housing substantially enclosing the rotatable gantry, ~~and~~ the gamma detector, and the second radiation detector.

12. (Previously presented)The nuclear camera as set forth in claim 11, further including:

a second generally toroidal housing holding a second imaging modality, the second generally toroidal housing being mounted a fixed distance from the first generally toroidal housing.

13. (Currently amended) A nuclear camera including:

at least four SPECT radiation detectors rotatably arranged around an imaging region to receive emission radiation, the radiation detectors each disposed an equal constant fixed distance from an imaging isocenter, the radiation detectors each including a radiation sensitive surface ~~that responds to the first emission radiation~~;

a slat collimator disposed on each radiation detector between the radiation detector and the imaging region to provide planar collimation of incoming ~~first~~ emission radiation; and

a means for spinning the collimator and radiation sensitive surface of each SPECT radiation detector about a detector axis.

14. (Previously presented)The nuclear camera as set forth in claim 13, further including:

a generally circular rotatable gantry on which the radiation detectors are disposed; and

an optically opaque housing that is substantially transmissive for the first emission radiation.

15. (Previously presented)The nuclear camera as set forth in claim 13, further including radiation detectors configured for at least one of a different SPECT resolution and a different imaging modality.

16. (Previously presented)The nuclear camera as set forth in claim 13, further including:

a computed tomography scanner including a transmission radiation source and a transmission radiation detector disposed opposite the transmission radiation source on the rotatable gantry.

17. (Canceled)

18. (Currently amended) ~~The~~ A radiological imaging method ~~as set forth in claim 17, further~~ including:

circularly orbiting at least one radiation detector about an imaging volume at a fixed radial distance from a first axis of rotation through the imaging volume;

detecting radiation from the imaging volume at a generally planar radiation sensitive region of the radiation detector, the radiation sensitive region facing the imaging volume during the fixed radius circular orbiting;

during the circular orbiting, spinning a slat collimator and a radiation sensitive array about an axis perpendicular to the first axis of rotation;

integrating radiation detected over generally planar regions defined by the slat collimator to generate plane integral projection views; and

reconstructing an image representation of the imaging volume from the plane integral projection views.

19. (Previously presented) The radiological imaging method as set forth in claim 18, wherein the orbiting rotates each of a plurality of detectors to

common locations M times, where M is an integer, and the collimator and radiation sensitive array are spun one of $180^{\circ}/M$ and $360^{\circ}/M$ at each location.

20. (Previously presented)The radiological imaging method as set forth in claim 18, further including:

selecting a minimum width of the generally planar radiation sensitive array in a direction parallel to the generally planar regions to provide a selected radiation detection sensitivity.

21. (Currently amended) The radiological imaging method as set forth in ~~claim 17~~ claim 18, wherein the orbiting includes:

orbiting a plurality of radiation detectors over an angle of 180° divided by the number of radiation detectors.

22. (Previously presented)The radiological imaging method as set forth in claim 21, further including:

selecting at least one of collimator slat spacing and collimator height in accordance with a selected resolution and the fixed radial distance.

23. (Currently amended) The radiological imaging method as set forth in ~~claim 17~~ claim 18, further including:

disposing a radiation transmissive, optically opaque shield between the at least one radiation detector and the imaging volume, the shield remaining stationary during the circular orbiting and blocking optical communication between the imaging volume and the radiation detector during the circular orbiting.

24. (Currently amended) The radiological imaging method as set forth in ~~claim 17~~ claim 18, further including:

orbiting at least four radiation detectors at the fixed radial distance.

25. (Previously presented)The radiological imaging method as set forth in claim 24, wherein the detectors include SPECT detectors collimated for a first resolution and at least one of:

a SPECT detector collimated for a second resolution,

a pair of PET detectors, and

a transmission radiation detector.

26. (Previously presented)An imaging apparatus comprising:

a rotatable gantry defining a gantry rotation axis and an imaging isocenter;

three or more gamma detectors arranged on the rotatable gantry at a fixed radial distance from the imaging isocenter;

a collimator located on each of said three or more gamma detectors; and

a means for processing data detected by said three or more gamma detectors to produce an image.

27. (Previously presented)The imaging apparatus of claim 26 wherein each of the collimators includes a plurality of spaced-apart slats and a means for spinning the collimator slats about a slat rotation axis.

28. (Currently amended) An imaging apparatus comprising:

at least four SPECT radiation detectors rotatably arranged around an imaging region, each detector disposed at an equal fixed and non-adjustable distance from an imaging isocenter, wherein each detector includes:

a slat collimator, wherein at least one of collimator slat spacing and collimator height are selected to provide a predetermined resolution at said fixed distance; and

a detector width selected to provide a predetermined radiation detection sensitivity at said fixed distance.

29. (Canceled)

30. (Previously presented)The imaging apparatus of claim 28 wherein each slat collimator includes a plurality of spaced-apart slats and a means for spinning the collimator slats about a slat rotation axis.